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Looking Back and Planning Ahead: Examining Global Best Practices in Communication for Inactivated Polio Vaccination Introduction in Rwanda

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The global polio community is committed to ensuring that all countries currently using oral polio vaccination (OPV) add at least one dose of inactivated polio vaccination (IPV) to their immunization schedules. Globally, communication efforts have been at the forefront of polio eradication programs for more than 25 years. This article combines research from secondary and primary sources of information on country experiences in polio vaccination and from the polio vaccination program in Rwanda. Secondary data included a review of 20 global articles that describe and analyze communication efforts for polio eradication and highlight best practices in communication approaches to address polio. The primary research consisted of qualitative and participatory data gathered from various stakeholders in two rural sites in Rwanda regarding approaches that could be used to develop culturally sound communication strategies to introduce IPV into the current routine expanded program on immunization schedule. Findings from this research highlighted the importance of identifying multichannel and multiaudience approaches to polio eradication that cut across different levels of the social ecological model. Findings further emphasize the importance of evidence-based and audience-centered communication programming to build and sustain the next big programmatic push for strengthening global routine immunization systems and replacing OPV with IPV. This article provides insights into the critical role that communication efforts have played and will continue to play in polio eradication worldwide.

The Global Polio Eradication Initiative (GPEI) was first established in 1988 and is led by the World Health Organization (WHO), the United Nations Children's Fund (UNICEF), Rotary International, the U.S. Centers for Disease Control and Prevention (CDC), and the Bill and Melinda Gates Foundation (UNICEF, 2014). In response to the World Health Assembly (2012) directive, the GPEI, in consultation with a wide range of governmental and non-governmental stakeholders, developed the Polio Eradication and Endgame Strategic Plan 2013–2018, with four goals: (a) detect and interrupt all polio virus transmission by the end of 2014; (b) strengthen routine immunization systems and withdraw oral polio vaccine (OPV); (c) contain polio virus and certify interruption of transmission; and (d) plan polio's legacy. Several GPEI reports along with a WHO position paper on polio vaccine policies provide global guidance on the specifics of inactivate polio vaccine (IPV) introduction and OPV withdrawal, with all countries currently using OPV adding at least one dose of IPV to the schedule (WHO, 2014, n.d.). To sustain the remarkable declines in polio endemic countries in the past 25 years, the next big programmatic push relies on strengthening global routine immunization systems and replacing OPV with IPV (Abdelwahab et al., 2014; Aylward & Tangermann, 2014; Closser et al., 2014).

Building on the well-documented and vital role that communication interventions have played in country experiences with polio eradication, the GPEI sponsored a communication-planning guide for IPV introduction and routine immunization strengthening (GPEI, 2015) that provides the template for formative research relevant to the development of communication interventions. In early 2015, Drexel University received a contract from UNICEF Rwanda to conduct formative research—including secondary and primary data—to assist with planning, managing, and implementing the coadministration of IPV into routine immunization, and subsequent OPV 2 withdrawal. This article presents results from this formative research that responds to the following key research question: What are the best practices and lessons learned from communication efforts that can be applied to the introduction of at least one

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dose of IPV into routine immunization and subsequent withdrawal of OPV in a phased manner in Rwanda? This article builds upon the current body of literature on polio eradication efforts to show how communication approaches can be leveraged to make the Polio Endgame, specifically the withdrawal of OPV, a reality. The primary research from Rwanda provides a specific example of formative research for understanding polio eradication communication approaches that can be considered by other countries for introducing IPV within their routine immunization schedules. It is important to mention at the outset that Rwanda has achieved much higher trust in vaccination and in the government as a whole and has been successful in achieving higher vaccination coverage than many other countries.

The methods and results sections of this article are written sequentially, first describing the secondary research conducted by the research team, followed by data and analyses of the primary research. The discussion section of this article integrates the findings from both sources of data.

Methods

In this article, we focus on secondary analysis findings from the published literature on communication interventions, and primary data results from the two rural communities in Rwanda.

Secondary Analysis

The literature review was conducted using PubMed Central for peer-reviewed publications and Google Scholar for scholarly literature including reports and books. The review examined all possible combinations of one key term from each of two lists, one with communication approaches and the second on polio efforts (Table 1).

Given the rapidly changing landscape with regard to polio eradication interventions, the time frame for the literature review included articles published over the past 10 years, from 2004 and 2014 (inclusive). Documents were shortlisted using three criteria: title, abstract, and full-text review. The original search yielded 1,431 results, and slightly less than 10% (n = 152) were shortlisted on the basis of a review of titles. A secondary review of titles yielded 68% (n = 104) titles for abstract review. The subsequent review of abstracts resulted in 46 articles, which were culled down to 41 after removing duplicates. Of the 41 articles in the final database, 21 provided information on supply and demand determinants associated with polio eradication efforts and 20 contained information on communication efforts addressing polio eradication (Figure 1). This article focuses on the 20 articles that described and evaluated communication efforts.

Table 1. Combination of Search Terms for Literature Review

Communication approaches	Intervention focus
Communication development (for/and)	Polio eradication
Behaviour change communication	Polio endgame
Community mobilization	Oral polio vaccination withdrawal
Social mobilization	Inactive polio vaccination coadministration
Communication media campaigns	Polio routine immunization
Social media	
Information and communication technologies	
Advocacy	

Secondary Research Sample

Of the 20 articles dealing with communication efforts to address polio, 12 were from Google Scholar and eight from PubMed. All articles were peer-reviewed publications, except for one conference proceeding. Nine articles described polio eradication interventions implemented in the South Asia region. Another five articles described polio programs based in West and Central Africa. Three articles were classified as global, meaning that they reviewed polio eradication interventions from various countries. In terms of country-specific locations, eight articles described polio eradication interventions in India, four discussed polio communication programs in Nigeria, and two described efforts in Pakistan. One article detailing relevant immunization efforts was found for each of the following countries: Kenya, Chad, Rwanda, Ghana, Nepal, and Brazil (Table 2).

Primary Research

Primary data were collected in Rwanda to build an evidence base for the design and implementation of a communication strategy to address supply and demand dimensions. By understanding the facilitators and barriers to the coadministration of IPV and the planned transition from OPV to IPV, tailored communication strategies can be developed. While the primary data collection is based in Rwanda, the methods used and the results from this research can be considered in other countries and contexts while keeping cultural, social, and economic variations in mind.

Primary Research Sample

Selection of rural sites for the primary research was informed by data from the 2010 Rwanda Demographic and Health Survey (Rwanda Demographic and Health Survey [RDHS], 2011) and the 2013 Rwandan Ministry of Health immunization coverage data, to identify individual- and geographic-level influences on full immunization rates, with the goal of selecting districts with varying levels of coverage. The RDHS (2011) reported a full vaccination rate of 90.1% across Rwanda, making it

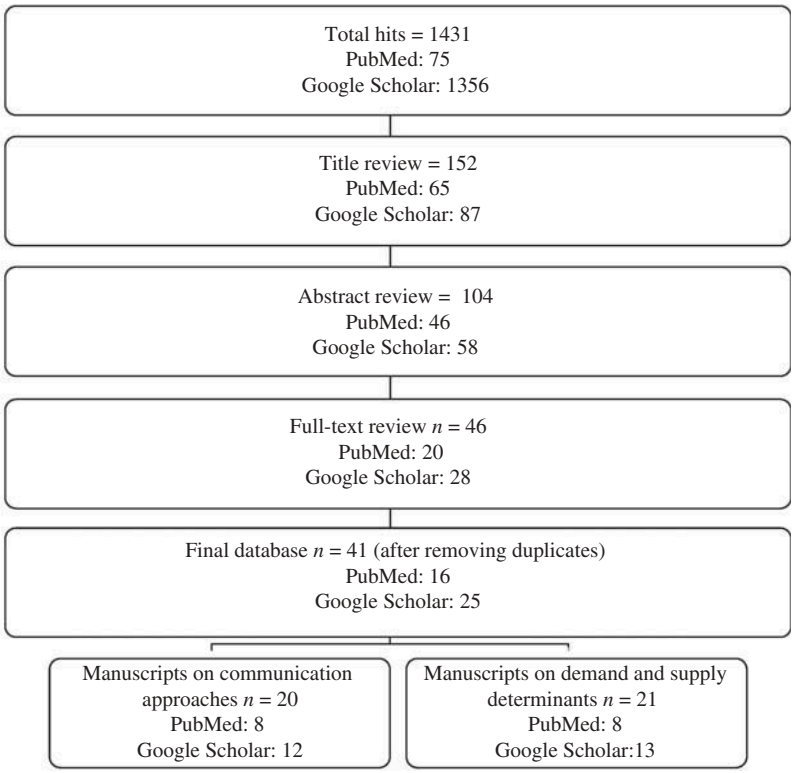

Fig. 1. Literature review sampling selection process.

Table 2. Key Coding Criteria by Number of Manuscripts

Key coding criteria	Number of articles
Search engine	
PubMed	12
Google Scholar	8
Type of Manuscript	
Peer-reviewed journal article	19
Conference proceeding	1
Region	
South Asia	9
West and Central Africa	5
Global	3
East Asia	2
Latin America	1
Country	
India	8
Nigeria	4
Pakistan	2
Kenya	1
Chad	1
Rwanda	1
Ghana	1
Nepal	1
Brazil	1

hard to find a truly low coverage district. However, on the basis of individual and multilevel statistical modeling, two districts appeared to be well suited for field work: (a) Muhanga district, with relatively low coverage of 80–90% for both DPT-HepB-Hib 3 and measles in 2013, and 86% of respondents ages 12 to 60 months with full immunization; and (b) Ruhango district, which had a high coverage rate of greater than 90% in 2013 for both DPT-HepB-Hib 3 and measles, and a full immunization rate of 97% (RDHS, 2011). Other criteria for selection of these districts included their proximity to Kigali, facilitating the fieldwork in the short time period allotted for the research. There were no identifiable differences in supply or access to vaccines in these districts that would explain vaccination coverage differentials. On the basis of consultation with local partners, these districts were confirmed as appropriate fieldwork sites.

Primary Research Tools

The primary data collection in Rwanda explored knowledge, attitudes, and practices among healthcare providers, caregivers to infants, and community influentials, including community health workers, religious leaders, traditional healers, and village leaders. Qualitative methodologies included focus group discussions, in-depth interviews, and transect walks with community mapping. The focus group discussions

with caregivers incorporated three participatory activities including story elicitation, barrier and motivator identification, and social network maps.

Primary Research Sample Size

The total primary research sample consisted of more than 21 distinct data collection activities, including 10 individual and 11 group activities, yielding more than 28 hours of recorded data that captured the perspectives of 84 individuals. At the district level, 10 in-depth interviews were conducted with seven healthcare professionals and three village influentials; an additional five village term leaders participated in a focus group discussion. Two focus group discussions were conducted with seven community health workers. Six focus groups in two locations captured views from 37 mothers and 13 fathers. Twelve additional participants served as informants for two transect walk/community-mapping activities.

Results

Results from the secondary analysis are presented first, followed by the primary research findings from Rwanda.

Secondary Analysis

The secondary analysis of articles examined several domains of best practices for designing, implementing, and evaluating communication approaches for polio efforts. These best practices included, for example, using theoretical and conceptual frameworks for program design, applying specific strategic approaches for implementation, and different types of evaluation (Table 3).

The interventions described in the literature reviewed, highlighted a range of theoretical and conceptual frameworks. The social ecological model that takes into account the interconnected influences of family, peers, community, and society on behaviors was the most commonly cited theoretical framework, underpinning seven interventions (Sallis & Owen, 2002). Four interventions utilized community organizing and community building approaches and three drew upon the steps/stages approach to social change (Minkler, Wallerstein, & Wilson, 2008; Prochaska, Redding, & Evers, 2008). Common to these three frameworks is a macro-level focus as compared with an individual-level approach to behavior change.

Secondary Research: Strategic Approaches

In terms of strategic approaches, interventions most commonly leveraged community-based approaches (n = 11), capacity-building efforts (n = 8), and interpersonal approaches (n = 6). In addition, eight articles reported the use of more than one approach to meet the intervention's objectives. Although the search term *advocacy* yielded four articles, it was not identified as a main communication approach for any of the interventions.

Policy-Level Approaches. Two articles reported positive, unintended policy-level consequences from their interventions: (a) Domingues and colleagues (2014) mentioned how their national polio policy in Brazil was revised paying special attention to costs of the revised vaccination schedule, sustainability (contracting with local suppliers), equity (access for all children), vaccination strategies, and optimal scheduling; (b) Nasiru and colleagues (2012) commented that their community health worker intervention was adopted as a national health tool for polio eradication in Nigeria.

Behavior Change Communication and Social Marketing Approaches. Behavior change communication and social marketing were described in specific articles and are summarized here. Lessons learned from the global implementation of behavior change communication approaches highlight the critical role that behavior change communication plays in increasing demand for vaccinations and addressing supply issues by contributing to provider-based or system-based interventions to enhance access to vaccination services across a variety of settings, including the workplace and schools (Nair & Nair, 2012). The literature also highlighted the importance of social marketing as an integrated approach to polio eradication. According to Goswami (2007), social marketing engages various stakeholders, including government, public health employers, businessmen, media, academia, the private health care sector, and the community. Furthermore, community participation, advocacy, and leadership—all components of social marketing—are critical to overcoming individual- and structural-level barriers. Last, with its emphasis on tailored messages and audience segmentation, social marketing allows for a multichannel approach to reach multiple audience groups at local and national levels.

Social Mobilization and Community-Based Approaches. Manuscripts from India, Nigeria, and Pakistan showcased the instrumental role of social mobilization efforts, specifically through Muslim clerics, in promoting vaccine coverage, especially during supplemental immunization activities (Coates et al., 2014; Nasir et al., 2014; Nasiru et al., 2012; Obregon & Waisbord, 2010; Weiss et al., 2013). Historically, there had been strong opposition to polio vaccination among Muslim groups. According to the literature, training and engaging local Imams has proven to be a successful strategy for transforming barriers (gatekeepers) into change agents. Nasir and colleagues (2014) described how Friday sermons and after-prayer talks were powerful channels through which information from an intervention was disseminated and individuals mobilized in Nigeria. Similarly, the Social Mobilization Network in India found that mosque announcements were important determinants of improved polio vaccination uptake; local clerics became linchpins of local vaccination efforts, largely because of the trust and respect

Table 3. Secondary Analysis of Manuscript Domains for Best Practices

No.	Citation	Country/ location	Program objectives	Theoretical framework	Strategic approach	Research design
1	Chaturvedi et al. (2009)	India	Improving acceptance of pulse campaigns for oral polio supplementary immunization activities	Social norms	Community approaches	Qualitative observational
2	Choudhury et al. (2011)	India	Improving physician knowledge, attitudes, and behaviors on polio vaccination	Steps/stages approaches to behavior change	Capacity building	Quantitative observational
3	Coates et al. (2013)	India	Description of the Social Mobilization Network for polio vaccination	Social ecological model	Cross-cutting	Secondary analysis
4	Dasgupta et al. (2008)	India	Acceptance of Pulse Polio campaigns	Social ecological model	Community approaches	Qualitative observational
5	Domingues et al. (2014)	Brazil	Introduce inactivated polio vaccination as part of sequential polio vaccination schedule for all infants	Social ecological model	Cross-cutting	Secondary analysis
6	Goswami (2007)	India	Examine the role of social marketing for polio eradication efforts	Social marketing	Cross-cutting	Secondary analysis
7	Hussain et al. (2012)	India	Acceptance of door-to-door polio eradication campaigns	Social norms	Cross-cutting	Qualitative observational
8	Langston et al. (2014)	Rwanda	Examine the effectiveness of the integrated community case management of childhood illness	Community organizing/ community building	Community approaches	Secondary analysis
9	Michael et al. (2014)	Nigeria	Study effectiveness of SIA home visits	Social ecological model	Capacity building	Quantitative observational
10	Mushtaq et al. (2010)	Pakistan	System and workforce improvement	Systems level	Capacity building	Quantitative observational
11	Nair & Nair (2012)	Global	Examining the role of behavior change communication for polio vaccination	Social ecological model	Cross-cutting	Secondary analysis
12	Nasir et al (2014)	Nigeria	To increase polio vaccination coverage	Steps/stages approaches to social change	Community approaches, capacity building	Quantitative observational
13	Nasiru et al. (2012)	Nigeria	To increase the uptake of polio vaccination in a high-risk low-coverage community	Steps/stages approaches to social change; community organizing/ community building	Community approaches, interpersonal communication	Pre- and posttest design
14	Ndiaye et al. (2014)	Chad	To vaccinate nomads in response a polio outbreak	Cross-cutting	Capacity building	Post-only intervention and control design
15	Obregon & Waisbord (2010)	Africa and Asia	The role of social mobilization on addressing polio eradication	Community organizing/ community building	Mass media, community approaches	Secondary analysis
16	Odusanya et al. (2008)	Nigeria	Parental knowledge, attitudes and practices associated with vaccination coverage	Social ecological model	Interpersonal communication, community approaches	Quantitative observational
17	Sheikh et al. (2014)	Kenya	To contain an outbreak of polio in refugee camps and surrounding communities	Cross-cutting	Community approaches	Quantitative observational

(*Continued*)

Table 3. (Continued).

No.	Citation	Country/ location	Program objectives	Theoretical framework	Strategic approach	Research design
18	Subedi (2012)	Nepal	Parental knowledge attitudes and practices toward vaccination	Social norms	Interpersonal communication, community approaches	Quantitative observational
19	Thacker et al. (2013)	Pakistan, India and Ghana	Role of civil society in the Global Vaccine Action Plan	Community organizing/ community building	Cross-cutting	Policy review
20	Weiss et al. (2013)	India	Polio eradication in Uttar Pradesh India	Social ecological model	Interpersonal communication, community approaches	Secondary analysis

Note. When more than two theoretical frameworks or strategic approaches were mentioned, they have been categorized as cross-cutting.

community members had for them. In addition to clerics, data from India highlighted the innovative use of child mobilizers, called *Bulawa tollies*, who were tasked with mobilizing families to vaccinate their children (Coates et al., 2014). The literature documented how child mobilizers were important contributors toward improved supplemental immunization activities (Weiss et al., 2013). Key lessons from the literature reviewed suggest that social mobilization is a complex and dynamic process that can be both activist and pragmatic at the same time (Obregon & Waisbord, 2010) and that it is critical to tailor social mobilization efforts to local contexts and think of it as a combination of top-down and bottom-up efforts with interpersonal communication (dialogue and engagement) serving as critical components.

Lay Health Worker Approaches. A final strategic approach that emerged from the review was the reliance on lay community health workers (CHWs) in immunization efforts, especially for identifying missed children and reaching marginalized or hard-to reach groups. In Rwanda, Langston and colleagues (2014) described the scaling up of integrated community case management of childhood illnesses in six districts. The program prioritized community mobilization strategies to generate demand for CHW services. Peer support groups for the CHWs, designed to provide critical quality control and motivation for community health workers, helped with cross-learning, increased social capital, and improved CHW performance. Coates and colleagues (2013) lauded the valuable contributions of community mobilization coordinators, who were a part of the Social Mobilization Network in India who functioned as the key change agents for polio eradication by focusing on raising awareness of polio and tracking missing children, while emphasizing the importance of childhood immunization, and promoting routine immunization, hygiene, and sanitation.

Secondary Research: Design and Methods

An examination of the research design and methods used to evaluate the effectiveness of communication approaches to address polio indicated that half of the interventions (n = 10) were evaluated using observational studies, five of which were quantitative and the other five qualitative. Another six studies did not include any primary data collection and instead relied on secondary data analysis. Quantitative methods were used slightly more often (n = 7) than qualitative methods (n = 6). Few interventions (n = 3) were evaluated using a mixed-methods approach, and no interventions took advantage of participatory research methods.

Primary Research

Primary data collection is vital to any planned communication intervention, and builds upon the existing body of literature (that may also include evidence in the form of primary data). With this goal, we conducted primary research with multiple stakeholders in Rwanda. The primary research was focused on collecting and analyzing information on various approaches that could be used to develop culturally and socially appropriate communication strategies for introducing IPV into the current routine Expanded Program on Immunization (EPI) schedule, and to pave the way for the co-administration of IPV and OPV before the complete withdrawal of OPV.

Primary Research Findings

A grounded theory approach was used to analyze translated transcripts from the fieldwork, that is, categorizing the strategic approaches and channels of communication that would resonate with key audiences in Rwanda. Three specific channels emerged as critical in the Rwanda context: (a) interpersonal communication and counseling (IPC/C); (b) community and social mobilization; and (c) mediated communication.

Interpersonal Communication and Counseling. IPC/C was noted by a range of participants as being the most effective channel for communicating information about vaccination. The specific IPC/C components mentioned by participants included several categories. First, training for various community-based healthcare providers and for other relevant nonhealth professionals on the vaccination schedule as a whole, on the specific changes involved in the introduction of IPV, and on how to address any questions or concerns that caregivers might have about the newly introduced vaccine. Participants were vocal in their request for training before the implementation of the new vaccination schedule. Of specific importance was counseling training designed to "improve their ability and efficacy to communicate with pregnant women, mothers with children, fathers, and parents in general." The primary data revealed uneven knowledge among healthcare providers regarding the current polio vaccination schedule and possible contraindications of the polio vaccine. One provider expressed the opinion that they should simply stick to OPV because it is easier and less painful than an injection: "If the medicine inside OPV and IPV is the same, then why change it?"

A second component of the IPC/C approach included counseling for parental caregivers by community-based providers, specifically mobilizers and CHWs, on the changes to the routine EPI schedule, why these changes are important, and how such changes would affect caregivers. In addition, all participants considered improving the providers' ability to respond to questions about the benefits and side effects of the additional vaccine as being vitally important.

A third component of IPC/C is word-of-mouth communication, which emerged as the preferred form of communication about polio vaccination. Participants repeatedly suggested that providing relevant information about the new polio vaccine to key individuals who could be charged with the task of spreading the word would be the preferred approach for disseminating correct information about the change to the polio vaccination/routine immunization schedule. According to one key influential, "Once the information

is spread through a community, different people will talk about vaccination in different places and times." The interpersonal diffusion model proposed by the participants is essentially a social network approach. The presence of change agents and cross-network connectors would allow information to flow within and between networks and diffuse through the social system over time. To operationalize such a model, it is important to identify key individuals who are central to the social network and also nodes that constitute weak ties to other networks. This formative research, through the inclusion of social network mapping as a participatory activity within the focus group discussions, was able to provide insights to some potential nodes in Rwanda, that is, CHWs, community mobilizers, leaders (religious, chiefs, social welfare), and representatives of the village chief. These individuals play multiple roles and have access to different members of a given community and can serve as a source of correct information for caregivers and also serve as gatekeepers to encourage caregivers to seek information.

Peer communication networks emerged as an important source for information about immunization and polio vaccination. There were several mentions of the role that neighbors could play in talking to one another about immunization: "If there is a family with a small child whose parents are delaying or aren't showing any willingness to get the child vaccinated, neighbors should encourage the family to vaccinate the child." Health providers also noted that pregnant women who are counseled during an antenatal clinic visit could diffuse information about polio vaccination to other women in their community.

Community and Social Mobilization. There was no clear distinction between IPC/C and community-based efforts. For example, individual and group counseling was referenced interchangeably. Vaccination is not a taboo topic requiring confidential and individualized counseling and participants across the board mentioned the importance of meetings as a way to communicate messages. According to one service provider at a district hospital, current vaccination campaigns involve getting a group of parents together and providing them with information on the benefits of vaccination. Meetings were considered to be the most effective way of communicating information about IPV as well as to display commitment and build trust within communities.

With regard to involving community members in mobilization efforts, there appear to be several ongoing programs within which IPV information could be integrated. Announcements and use of megaphones to communicate information was mentioned in both districts. Apart from existing mobilization efforts, there were suggestions about special mobilization activities that would allow community members to be sensitized and reach out to family members of a newborn to enquire about vaccination. The key idea expressed across stakeholders was that: "the community members can all be *abahwituzi* (a Rwandan word for someone who awakens the community).

From a community perspective, it is important to select meeting locations that evoke a sense of place for community members. Data from the transect walk in Ruhango, for example, drew attention to an avocado tree where babies were weighed and community meetings typically took place. The avocado tree could make for a prime location to hold meetings and disseminate key messages on the inclusion of IPV and gradual withdrawal of OPV.

Mass Media Communication. Radio emerged as the most viable form of mediated communication according to all participant types. Despite the lack of electricity in the villages, battery-operated radios were commonly used. There was evidence of radio having been a viable form of communication for other health issues such as Ebola. The importance of an integrated strategy where radio messages reinforced and were reinforced by other information was mentioned: According to the community health workers in Ruhango, "Radio can be used to spread the message, a lot of information can spread through radio … So when CHWs go to the community and conduct counseling people will say "oh! This is the same information we heard on the radio!"

Caregivers did not mention TV as a viable channel and key influentials mentioned that they do not have access to TV because of lack of electricity. TV was still considered a viable information channel for other Rwandans who participants considered to be "ahead of them and their communities." The research team probed about mobile phones and Internet use. The providers displayed some awareness but no utilization of existing SMS services for sending texts regarding missed vaccinations or adverse events.

In terms of print material, the research team was shown a handful of materials being used as part of the EPI program. One key point made by both service providers and influentials was that any materials should be visual and/or pictorial so as to appeal to a largely nonliterate audience. Another was that posters depicting severe cases of vaccine-preventable diseases should be prominently displayed in healthcare settings. The rationale for this was that over time, the proportion of the population who have seen actual cases of vaccine-preventable diseases will become smaller, and thus it is important to show how terribly devastating these diseases can be to remind people about the importance of vaccinations.

Discussion

The global review of literature on communication interventions addressing polio, combined with formative research to help design communication strategies for Rwanda, offer important insights into the critical role that communication interventions have and can play, in global eradication efforts, specially so in countries with strong antivaccination sentiments. The findings presented in this article provide a foundation for developing communication interventions to promote the coadministration of IPV into the existing EPI schedule, and to transition from OPV to IPV in Rwanda.

As highlighted in the Maternal and Child Health Integrated Program (n.d.) report, the implementation and scale-up of at least one dose of IPV into routine immunization and subsequent withdrawal of OPV in a phased manner in Rwanda will rely on global and national actions. In addition, careful consideration of preparation, launch, and postlaunch efforts will be key in establishing and maintaining rollout. Keeping this in mind, key recommendations from this work pertain to supply- and demand-side factors. One of the key strengths in polio eradication efforts at the global level already evident in Rwanda is the importance of systematic supply systems. Specific examples from the global review highlight ways in which well-organized and equitable distribution of vaccination delivery systems can successfully improve child vaccination rates. Rwanda already has a solid systemic approach with relatively few supply-related issues with the current immunization schedule. However, it is important to consider the additional burden that expanded vaccination requirements would place upon current infrastructural capacity, requiring additional human, technical, and financial resources. As the global war on polio in other countries has indicated, when an intensive focus on vaccination is made, it may mean that in the long run other areas of child health will benefit. For example, resources for CHWs may initially be made available around EPI but may have longer lasting effect on maternal and child health activities at the community and national level.

A key lesson learned from country examples of polio eradication communication efforts pertains to the importance of intervening at multiple levels of the social ecological model. Results from Rwanda highlight the importance of implementing integrated interventions that are directed at multiple levels and stakeholders. The Rwanda data emphasized the use of social network approaches that allow for identification of key communication nodes, that is, individuals who can act as message multipliers and motivators within specific communities to help families make a seamless switch from OPV to IPV.

The global literature highlights the importance of incorporating polio vaccination into the social and cultural fabric of communities. Myths and misperceptions about polio vaccination and fatigue with repeated rounds of drops has derailed and delayed the global eradication of polio (Cochi, Freeman, Guirguis, Jafari, & Aylward, 2014; Obregon et al., 2009). Inclusion of bottom-up community and social mobilization approaches are required to reach the final milestone of polio eradication. In Rwanda, the current strong adherence to the existing recommended EPI schedule is a fundamental strength. The planned addition of IPV builds on the normative behavior across all sectors of society for children to receive full immunization on schedule. In addition to the widespread acceptability of vaccinations throughout Rwanda, a broader trust in healthcare system and medical science was also widely seen, which can be leveraged into a rapid uptake of IPV. Existing literature demonstrates that when stakeholders have trust in the health system, they accept new recommendations as improvements over older strategies.

In the context of positive social norms, communication messages in Rwanda could emphasize that transitions are always for the better and are based on new evidence of what works best to protect children's health. Rather than explain or justify complex Global Polio Eradication Initiative plans for stepwise phase-out, a more basic message would be that progress in prevention requires flexibility, and that uptake of the newest recommendations is a benefit of living in a country with strong health sector investments.

The primary and secondary research showed that the success of several interventions in the literature was linked to communication efforts that engaged local community leaders and lay health workers (e.g., CHWs). The reliance on CHWs deserves specific attention in the Rwandan context. In terms of human capital, the remarkable establishment of the national CHW network in Rwanda is a noteworthy strength. The qualitative data revealed a deep trust in, and thus a vital public health and community role for these individuals. These CHWs are the front-line workers of the public health system. With adequate training and supportive supervision, they can serve as the link between caregivers and the healthcare system using a social network approach. At the same time, there is some evidence of variation in knowledge and skills and concerns about being overworked among CHWs, and therefore some sort of training and certification would be useful.

Monitoring polio vaccination uptake through simple yet comprehensive recordkeeping processes emerged in the literature as a key component of success in polio eradication, especially when ensuring that hard-to-reach and disadvantaged populations were reached through repeated national polio campaigns and supplementary immunization activities. Achievement of the Polio Endgame goals, specifically strengthening routine immunization and replacing OPV with IPV requires ongoing monitoring. A current low-tech but important monitoring tool that is widely implemented in Rwanda (and in other countries) is vaccination cards. These cards are used by the health providers to track vaccination uptake and follow-through, and serve as reminders to families to follow the vaccination schedules in a manner appropriate for parents and caregivers with low levels of literacy.

A final important discussion point from the global review that is of relevance to Rwanda is one of methodological quality and rigor. One methodological challenge noted in the literature review was the lack of preintervention data to measure program impact. The narrow focus of many of the analyses, for example, only examining geographic differences, further raises concerns about

generalizability. More diversity in the types and kinds of data collected and analyzed, for example, cost-effectiveness is warranted. Some quantitative studies did have robust surveys, adequate response rates, strong analyses, and thus valid findings. Some qualitative studies yielded deeply rich and contextualized data.

The desk review uncovered some interesting uses of traditional methods, for example, one study used street intercept surveys to find mothers and children and screen for vaccination status. The desk review also showcased innovative techniques, for example, an intervention designed to reach nomads in Chad used existing migration patterns to identify a point-of-intervention (Michael et al., 2014; Ndiaye et al., 2014). These methodological limitations and successes provide a foundation upon which to build evidence-based communication strategies in Rwanda.

Conclusion

This article presents the results from a global review of communication interventions for polio eradication and highlights some global best practices learned through these efforts over the past decade. Building on the literature review, primary research was conducted in Rwanda to determine specific approaches for designing, implementing, and evaluating communication strategies to achieve polio eradication in Rwanda, and to provide a model for other countries. This combination of data looking into the past and planning for the future provides an evidence-based foundation to follow through on the WHO recommendations to introduce IPV into current EPI schedules and transition from OPV to IPV across the globe.

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References

Abdelwahab, J., Dietz, V., Eggers, R., Maher, C., Olaniran, M., Sandhu, H., & Vandelaer, J. (2014). Strengthening the partnership between routine immunization and the Global Polio Eradication Initiative to achieve eradication and assure sustainability. *Journal of Infectious Diseases*, *210*(Suppl. 1). S498–S503. doi:10.1093/infdis/jiu041

Aylward, B., & Tangermann, R. (2014). The global polio eradication initiative: Lessons learned and prospects for success. *Vaccine*, 29(Suppl.), D80–D85.

Chaturvedi, S., Dasgupta, R., Adhish, V., Ganguly, K. K., Rai, S., Sushant, L., … Arora, N. K. (2009). Deconstructing social resistance to pulse polio campaign in two North Indian districts. *Indian Pediatrics*, *46*, 963–974.

Choudhury, P., Thacker, N., Gargano, L. M., Weiss, P. S., Vashishtha, V. M., Amladi, T., ... Hughes, J. M. (2011). Attitudes and perceptions of private pediatricians regarding polio immunization in India. *Vaccines*, *29*(46), 8317–8322.

Closser, S., Cox, K., Parris, T., Landis, M., Justice, J., Gopinath, R.,… Nuttal, E. (2014). The impact of polio eradication on routine immunization and primary health care: A mixed-methods study. *Journal of Infectious Diseases*, *210*(Supp. 1), S504–S513. doi: 10.1093/infdis/jit232

Coates, E. A., Waisbord, S., Awale, J., Solomon, R., & Dey, R. (2013). Successful polio eradication in Uttar Pradesh, India: The pivotal contribution of the Social Mobilization Network, an NGO/UNICEF collaboration. *Global Health: Science and Practice*, *1*(1), 68–83.

Cochi, S. L., Freeman, A., Guirguis, S., Jafari, H., & Aylward, B. (2014). Global Polio Eradication Initiative: Lessons learned and legacy. *The Journal of Infectious Diseases*, *210*(Supp. 1), S540–S546. doi: 10.1093/infdis/jiu345

Dasgupta, R., Chaturvedi, S., Adhish, S. V., Ganguly, K. K., Rai, S., Sushant, L, & Arora, N. K. (2008). Social determinants and polio 'endgame': A qualitative study in high-risk districts of India. *Indian Pediatrics*, *45*(5), 357–365.

Domingues, C. M. A. S., de Fátima Pereira, S., Cunha Marreiros, A. C., Menezes, N., & Flannery, B. (2014). Introduction of sequential inactivated polio vaccine–oral polio schedule for routine infant immunization in Brazil's National Immunization Vaccine Program. *Journal of Infectious Diseases*, *210*(Suppl. 1), S143–S151.

Global Polio Eradication Initiative (GPEI). (2015). *Communication planning guide for IPV introduction and routine immunisation strengthening*. Retrieved from http://www.who.int/immunization/diseases/poliomyelitis/endgame_objective2/inactivated_polio_vaccine/Comm_Planning_Guide_IPV_intro-March2015.docx

Goswami, R. (2007, April 8). *Role of marketing in polio eradication*. Paper presented at the International Marketing Conference on Marketing & Society, Kanpur, India. Retrieved from http://dspace.iimk.ac.in/bitstream/handle/123456789/658/371-386.pdf

Hussain, R. S., McGarvey, S. T., Shahab, T., & Fruzzetti, L. M. (2012). Fatigue and fear with shifting polio eradication strategies in India: A study of social resistance to vaccination. *PloS ONE*, *7*(9), e46274.

Langston, A., Weiss, J., Landegger, J., Pullum, T., Morrow, M., Kabadege, M., … Sarriot, E. (2014). Plausible role for CHW peer support groups in increasing care-seeking in an integrated community case management project in Rwanda: A mixed-methods evaluation. *Global Health: Science and Practice*, *2*, 342–354.

Maternal and Child Health Integrated Program. (n.d.). *Bottlenecks and breakthroughs: Lessons learned from new vaccine introductions in low-resource countries, 2008 to 2013*. Retrieved from http://www.jsi.com/JSIInternet/Inc/Common/_download_pub.cfm?id=15580&lid=3

Michael, C. A., Ashenafi, S., Ogbauanu, I. U., Ohuabunwo, C., Sule, A., Corkum, M., Mackay, S., … OPV Campaign Missed Children Study Team. (2014). An evaluation of community perspectives and contributing factors to missed children during an oral polio vaccination campaign—Katsina State, Nigeria. *Journal of Infectious Disease*, *210*(Suppl. 1), S131–S135.

Minkler, M., Wallerstein, N., & Wilson, N. (2008). Improving health through community organizing and community building. In K. Glanz, B. K. Rimer, & K. Viswanath (Eds.), *Health behavior and health education: Theory, research, and practice* (4th ed., pp. 287–312). San Francisco, CA: Jossey-Bass.

Mushtaq, M. U., Shahid, U., Majrooh, M. A., Shad, M. A., Siddiqui, A. M., & Akram, J. (2010). From their own perspective—Constraints in the Polio Eradication Initiative: Perceptions of health workers and managers in a district of Pakistan's Punjab province. *BMC International Health and Human Rights*, *10*(1), 22–32.

National Institute of Statistics of Rwanda, Ministry of Health, and ICF International. (2012). *Rwanda Demographic and Health Survey 2010*. Calverton, MD: Authors.

Nair, R., & Nair, S. S. (2012). Is behaviour change communication an effective strategy for increasing immunization coverage? *Advance Tropical Medicine and Public Health International*, *2*(2), 40–60.

Nasir, S., Aliyu, G., Ya'u, I., Muktar, G., Muktar, M., Mahmud, Z., … El-Kamary, S. S. (2014). From intense rejection to advocacy: How Muslim clerics were engaged in a polio eradication initiative in Northern Nigeria. *PLoS Medicine*, *11*(8), e1001687.

Nasiru, S, Aliyu, G., Gasasira, A., Aliyu, M. H., Zubair, M., Mandawari, S. U.,… El-Kamary, S. S. (2012). Breaking community barriers to polio vaccination in northern Nigeria: The impact of a grass roots mobilization campaign (Majigi). *Pathogens and Global Health*, *106*, 166–171.

Ndiaye, S. M., Ahmed, M. A., Denson, M., Craig, A. S., Kretsinger, K., Cherif, B., … Tuma, J. (2014). Polio outbreak among nomads in Chad: Outbreak response and lessons learned. *The Journal of Infectious Diseases*, *210*(Suppl. 1), S74–S84.

Obregón, R., Chitnis, K., Morry, C., Feek, W., Bates, J., Galway, M., & Ogden, E. (2009). Achieving polio eradication: A review of health communication evidence and lessons learned in India and Pakistan. *Bulletin of the World Health Organization*, *87*, 624–630. doi: 10.2471/BLT.08.060863

Obregon, R., & Waisbord, S. (2010). The complexity of social mobilization in health communication: Top-down and bottom-up experiences in polio eradication. *Journal of Health Communication: International Perspectives*, *15*(Suppl. 1), 25–47.

Odusanya, O. O., Alufohai, E. F., Meurice, F. P., & Ahonkhai, V. I. (2008). Determinants of vaccination coverage in rural Nigeria. *BMC Public Health*, *8*, 381–388.

Prochaska, J. O., Redding, C. A., & Evers, K. E. (2008). The Transtheoretical model and stages of change. In K. Glanz, B. K. Rimer, & K. Viswanath (Eds.), *Health behavior and health education: Theory, research, and practice* (4th ed., pp. 97–121). San Francisco, CA: Jossey-Bass.

Sallis, J. F., & Owen, N. (2002). Ecological models of health behavior. In K. Glanz, B. K. Rimer, & K. Viswanath (Eds.), *Health behavior and health education: Theory, research, and practice* (3rd ed., pp. 462–484). San Francisco, CA: Jossey-Bass.

Sheikh, M. A., Makokha, F., Hussein, A. M., Mohamed, G., Mach., O., Humayun, K., … Centers for Disease Control and Prevention. (2014). Combined use of inactivated and oral poliovirus vaccines in refugee camps and surrounding communities—Kenya, December 2013. *MMWR Morbidity and Mortality Weekly Report*, *63*(11), 237–241.

Subedi, G. (2012). Demand side barriers to immunization services in Terai districts of Nepal. *Nepal Population Journal*, *17*(16), 91–104.

Thacker, N., Vashishtha, V. M., Awunyo-Akaba, J., & Mistry, R. F. (2013). Civil society organizations, the implementing partners of the Global Vaccine Action Plan. *Vaccine*, *31S*, B97–B102.

UNICEF. (2014). *Accelerating progress on polio eradication: A global compact for UNICEF*. New York, NY: Author.

Weiss, W. M., Choudhary, M., & Solomon, R. (2013). Performance and determinants of routine immunization coverage within the context of intensive polio eradication activities in Uttar Pradesh, India: Social Mobilization Network (SM Net) and Core Group Polio Project (CGPP). *BMC International Health and Human Rights*, *13*(25), 1–15.

World Health Organization (WHO). (2014). Weekly epidemiological record. *Polio Vaccines: WHO Position Paper*, *9*(89), 73–92. Retrieved from http://www.who.int/wer/

World Health Organization (WHO). (n.d.). *The Polio Eradication Endgame: Brief on IPV introduction, OPV withdrawal and routine immunization strengthening, planning for IPV introduction: Frequently asked questions (FAQS)*. Retrieved from http://www.who.int/immunization/diseases/poliomyelitis/endgame_objective2/en/